

CITY OF LINCOLN, NEBRASKA, STANDARD SPECIFICATIONS

Chapter 30

SEEDING AND SODDING

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CHAPTER 30

SEEDING AND SODDING

30.00 DESCRIPTION

- A. The work described in this section shall pertain to any seeding, sodding or turf plugging work. Work shall include all labor, material and equipment as herein specified. The work shall comply with the requirements of all legally constituted authorities having jurisdiction.
- B. This work shall consist of furnishing, delivering and planting of plant material and all operations incidental thereto, in accordance with City of Lincoln Standard Plans, the Special Provisions, and these Specifications

30.01 RELATED ITEMS SPECIFIED ELSEWHERE

Chapter 2	Earthwork
Chapter 31	Landscaping Work
Chapter 32	Erosion Control

30.02 QUALITY ASSURANCE

- A. Contract sodding work to a single firm specializing in sodding and growing of turf grass. Firm shall have satisfactory record of performance on completed projects of comparable size and quality.
- B. Contract seeding work to a single firm specializing in seeding turf and/or wildflower mixes. Firm shall have satisfactory record of performance on completed projects of comparable size and quality.
- C. Contract plugging work to a single firm specializing in plugging grass. Firm shall have satisfactory record of performance on completed projects of comparable size and quality.
- D. Contractor must comply with American Sod Producers Association Classes of sod materials.
- E. The City Engineer, Landscape Architect or Representative may inspect sod, seed or plugs at site before planting, for compliance with requirements for genus, species, variety, size and quality. The City Engineer, Landscape Architect or Representative may reject unsatisfactory or defective material at any time during progress of work. Rejected materials shall be immediately removed from project site.
- F. Submittals

Certificate of Inspection: Submit certificates of inspection as required by governmental authorities.

Certified Analysis: Submit manufacturer's certified analysis, or, where applicable, Analysis of recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists. Include soil amendments and fertilizer materials.

List of Sources: Submit a written list of the supplies where the material was produced. Materials from unapproved sources will be rejected.

30.03 SOURCE QUALITY CONTROL

- A. Ship materials with certificates of inspection required by governing authorities. Comply with regulations applicable to sod, seed and materials.
- B. Do not make substitutions. If specified sod, seed and other materials are not obtainable, submit proof of non-availability to City Engineer, Landscape Architect or Representative.
- C. Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable. The actual planting shall be performed during those times in this season which are normal for such work as determined by weather conditions, and accepted practice in the locality.

30.04 PLANTING SEASON

Within thirty (30) days after receiving the signed contract, the Contractor shall submit a written list of the nurseries from whom the Contractor will purchase the materials, and the source where the material was produced. The list shall be submitted to the City Engineer, Landscape Architect or Representative. The Contractor will be notified if there are any unapproved sources of materials on the list. Materials from unapproved sources will be considered for rejection.

The planting season for all material shall be:

SEED April 15 - May 30. September 1 - October 1.

SOD March 1 to June 15, and September 1 to October 15.

PLUGS May 1 to August 1. Soil temperatures must consistently be above 60 degrees F (16 degrees C).

Sodding/Seeding/Plugging operations shall be performed during this season only, except when prior written permission is obtained from the City Engineer, Landscape Architect or Representative. The actual sodding/seeding/plugging shall be performed during those times in this season which are normal for such work as determined by weather conditions, and accepted practice in the locality.

30.05 MATERIALS (GENERAL INFORMATION)

A. GENERAL PLANT MATERIALS REQUIREMENT

- 1. All material shall comply with all applicable State and Federal laws, including inspection certifications which shall include the project number and the plant material that the certification covers. All material is subject to inspection by representatives of the City, State and Federal Governments.
- 2. All material furnished shall be true to name and type and legible labels shall be furnished to insure that all species, varieties, boxes, bundles, bales or other containers are identified. The information on the label shall cover the botanical genus, species, and common name or variety.
- 3. All material shall be sound, healthy specimens and first-class representatives of their species or variety, and shall have well formed tops and healthy root systems.

30.05 MATERIALS (GENERAL INFORMATION) (Continued)

4. Materials which are planted and later discovered to be not true to name, may be allowed to remain in place, as approved by the Engineer without payment being made therefor.
5. A representative sample of all material shall be submitted to the City Engineer, Landscape Architect or Representative for approval prior to planting if requested.
6. Any material that is planted which does not meet the specified minimum size shall be rejected or allowed to remain in place without payment being made therefor.
7. If a Contractor is unable to locate sufficient material in specified sizes, negotiation for unit price reduction shall be concluded prior to installation.
8. All material shall be true to species and variety specified and grown/produced in accordance with good horticultural practices.
9. Substitution of specified materials shall not be permitted unless authorized by the City Engineer, Landscape Architect or Representative.

B. SEED (GENERAL)

1. All seed shall be certified blue tag seed unless otherwise specified.
2. All seeds shall comply with the applicable State and Federal seed laws.
3. Seed used shall be free of crop, weed and inert matter.
4. The Contractor shall obtain from the seed dealer and furnish to the City Engineer, Landscape Architect or Representative an analysis of each type and lot of seed the Contractor proposed to use.
5. The analysis shall provide complete information on the seed as required by the State and Federal laws, as well as the specific crop and noxious weed seed present.
6. The Engineer may approve use of the seed if the information on the analysis is satisfactory. A minimum of eighty-five percent (85%) pure live seed (purity x germination x 100) is required for approval. Grass seed mixtures shall comply to the formulas provided in the seeding tables.

Listed below are Specifications for each type of grass seed mixture. Included in each Specifications are the grasses which are approved for use in that mixture. Other cultivars may be approved by the Engineers, Landscape Architect or City's Representative provided they are recommended by the most current NEBGUIDE, titled "Recommend Turfgrass Cultivars", published by the Cooperative Extension Service of the University of Nebraska at Lincoln, or by the Extension Turfgrass Specialist.

30.05 MATERIALS (GENERAL INFORMATION) (Continued)

APPROVED VARIETIES INCLUDE:

TYPE "A" Lawn Mix (High maintenance turf, sunny locations)

For use in sunny locations receiving higher maintenance, water on a regular basis and requiring adequate appearance and rapid establishment.

Kentucky Bluegrass Blend

Description:	Dark green color, good shade tolerance, disease resistant
Location:	Sites with irrigation, Office Parks, Residential
Seeding Period:	April 15 - May 30; September 1 - October 15
Composition:	60% Bluechip, Blue Moon and NuBlue Ky. Bluegrass, 40% Accent or Caddieshack and SR4220 Perennial Ryegrass
General Application:	Seed 2 to 3 lbs./M Sq. Ft.
Overseed Application:	Overseed 1 to 1 ½ lbs./M Sq. Ft.

TYPE "B" Fescue Mix (Medium maintenance turf, sunny locations)

For use in sunny locations receiving medium maintenance and requiring adequate appearance and rapid establishment.

Turf Type Tall Fescue, Kentucky Bluegrass and Perennial Ryegrass Mix

Description:	Lower growing dwarf fescue, high wear tolerance, lo
Location:	Parks and lower maintenance areas with or without irrigation. Mowing required.
Seeding Period:	April 15 - May 30; September 1 - October 15
Composition:	88% Arid 3, Jaguar 3, Masterpiece and Rembrandt (E), Turf Type Tall Fescue 7%, Blue Chip and NuBlue Kentucky Bluegrass - 5% Turf Type Perennial Ryegrass.
General Application:	Seed 5 to 6 lbs./M Sq. Ft.
Overseed Application:	Overseed 2 to 3 lbs./M Sq. Ft.

TYPE "C" Buffalograss (Low maintenance turf in sunny locations)

For use in sunny locations receiving little or no supplement water beyond establishment and requiring minimal mowing.

Buffalograss cultivars including: Legacy, Cody, Bowie, Bison, Texoka, Tatanka

Description:	Low growing, 4" - 8" little or no mowing
Location:	Medians, Boulevards, Open Space areas
Seeding Period:	April 15 - May 30; September 1 - October 15
Composition:	Varies between species
General Application:	Apply 2 to 3 pounds of seed per 1000 sq. ft.
Overseed Application:	Apply 1 to 2 pounds of seed per 1000 sq. ft.

30.05 MATERIALS (GENERAL INFORMATION) (Continued)

TYPE "D" Shade Mix (For use in shady locations)

For use in areas receiving little or no sun.

Description: Versatile mix of fescues, fairly low maintenance
Location: Residential, older areas of town (i.e. Capitol Environs District)
Seeding Period: April 15 - May 30; September 1 - October 15
Composition: MX 86 Sheeps Fine Fescue, Rescue 911 hard Fine Fescue, SR3200 Blue Fine Fescue, Jamestown Chewings Fine Fescue and Rose creeping Red Fine Fescue or equivalent(s).
General Application: Apply 4 to 6 Lbs./M Sq. Ft.
Overseed Application: Overseed 2 to 4 Lbs./M Sq. Ft.

TYPE "E" Low Growing Grass Mix (Outlying City and Acreages)

For use in areas requiring low maintenance, low growing, natural native prairie look

Description: Mixture of cool and warm season grasses
Location: Outlying areas of town, acreages:
Seeding Period: April 15 - May 30; September 1 - October 15
Composition: Blue Fine Fescue, hard Fine Fescue, Sheeps Fine Fescue, Blue Grama, Little Bluestem and Sideoats Grama
General Application: Seed 16 to 32 Lbs./Ac (½ to 1 Lb./1,350 Sq. Ft.).
Overseed Application: N/A

TYPE "F" Rural Mix (County Road and Rural NRD Projects)

For use in sunny rural locations and along roadsides for quick growth and erosion control.

Description: Strong sod forming abilities of bromegrass with deep rooting fescue
Location: County Roads, Rural NRD Projects
Seeding Period: April 15 - May 30; September 1 - October 15
Composition: See Below
General Application: Smooth Bromegrass, VNS 10 lbs pls/acre
Oats, Jerry 20 lbs pls/acre
Hairy Vetch 2.25 lbs pls/acre
Clover, Mammoth Red, VNS 2.25 lbs pls/acre
Switchgrass, NE 28 2.25 lbs pls/acre
18-46-0 Fertilizer 200 lbs/acre
Zinc Sulfate Monohydrate 20 lbs/acre
Overseed Application: N/A

TYPE "G" Native Prairie Mix

For use in sunny locations, low maintenance and taller grasses are acceptable.

Description: Mixture of (5) native warm season grasses
Location: Native Prairie, Natural Areas
Seeding Period: May 1 - May 30; September 1 - October 15
Composition: 2.0 PLS Lbs. Big Bluestem, 1.5 PLS Lbs. Each of Little Bluestem and Indiangrass, 1.0 PLS each of Canada and Virginia Wild Rya and 0.6 PLS Lbs. Each of Switchgrass and Sideoats Grama.
General Application: Apply 20 pounds per acre.
Overseed Application: N/A

30.05 MATERIALS (GENERAL INFORMATION) (Continued)

TYPE "H" Flood Plain Mix (For use in drainage channels and on channel side slopes)

For use in sunny locations with tolerance to standing water from 14 to 60 days.

Description:	Mixture of deep rooted grasses for wetlands
Location:	This mixture may be used along shorelines, dams and lowland pastures
Seeding Period:	April 15 - May 30; September 1 - October 15
Composition:	Big Bluestem, Canada Wildrye, Red Top, Reed Canarygrass, Virginia Wildrye, Switchgrass and Western Wheatgrass
General Application:	Seed 15 - 20 Lbs./Acre
Overseed Application:	N/A

TYPE "I" Waterway Mix

For use in areas required to conform to the county ASCS specifications for waterways.

Description:	Mixture blended for waterways
Location:	Waterways
Seeding Period:	April 15 - May 30; September 1 - October 15
Composition:	57% Smooth Brome grass, 11.50% Orchardgrass, 11.50% Tall Fescue and 20% Switchgrass.
General Application:	Apply 24 Lbs./Acre
Overseed Application:	N/A

C. SOD (GENERAL)

1. Sod shall be taken from sources approved by the City Engineer, Landscape Architect or Representative.
2. The sod shall be a first class representation of normal cultivars of bluegrass, fescue, buffalo grass or zoysia.
3. The Contractor shall furnish to the City Engineer, Landscape Architect or Representative, upon request, a list of the cultivars used to produce the sod.
4. Sod shall be uniform in color and quality and shall be free of weeds, diseases or other visible imperfections at the time of acceptance.
5. The sod shall be mowed and raked to remove stems, sticks and grass clippings prior to cutting.
6. The sod shall be cut to a depth of approximately 3/4 inch. Extreme care shall be taken in cutting, handling, transporting and laying the sod to avoid unnecessary damage to and loss of earth from roots of the sod.
7. Sod shall not have dry or dead edges.
8. Certified sod, if requested, shall have been inspected and approved by the State Certifying Agency.

APPROVED VARIETIES INCLUDE:

Rhizomatous Tall Fescue
Turf Type Tall Fescue
Bluegrass/Fescue Blend
Buffalo Grass (Legacy, Cody, Bowie, Bison, Texoka, Tatanka)
Zoysia Grass

D. GRASS PLUGS (GENERAL)

1. Grass plugs shall be taken from sources approved by the City Engineer, Landscape Architect or Representative.
2. The plugs shall be a first class representation of normal cultivars of specified grass.
3. The Contractor shall furnish to the City Engineer, Landscape Architect or Representative a list of cultivars used to produce the plugs.
4. Grass plugs shall be uniform in color and quality and shall be free of weeds, disease or visible imperfections at the time of acceptance.
5. Extreme care shall be taken in cutting, handling, transporting and placing the plugs to avoid unnecessary damage to and loss of earth from the roots of the plugs.

APPROVED VARIETIES INCLUDE:

Buffalo Grass (Legacy, Cody, Bowie, Bison, Texoka, Tatanka)
Zoysia Grass

E. FERTILIZER

All fertilizer shall be checked and approved by the City Engineer, Landscape Architect or Representative for acceptance prior to use. Fertilizer shall be a commercial turf product containing nitrogen, available phosphoric acid and soluble potash as required, in a recognized plant food form. All fertilize shall comply with the provisions of the State of Nebraska Fertilizer Act of 1955, with subsequent revisions.

This act requires:

1. Each brand and grade of commercial fertilizers must be registered by the Nebraska Department of Agriculture and Inspection.
2. Each container of commercial fertilizer shall have either placed on or affixed to the container in written or printed form, the new weight and the following information:
 - a. The name and address of the person guaranteeing the fertilizer.
 - b. The guaranteed analysis showing the minimum percent of plant food claimed in the following form:

Total nitrogen (N)___%
% Cold Water Insoluble Nitrogen (CWIN)(if applicable) ___%
Available Phosphoric Acid (P₂O₅)___%
Soluable Potash (K₂O)___%

If distributed in bulk, a written or printed statement of the weight and preceding information shall accompany delivery and be supplied to the City's Landscape Architect, Engineer or Representative. Any grade or mixture of grades of phosphoric acid and potash fertilizer may be used providing the proportions of the minimum rate of application per acre are in accordance with these Specification or as directed by the City's Engineer, Landscape Architect or Representative. Components of bulk blends must be close in particle size to prevent segregation. The City's Engineer, Landscape Architect or Representative may approve immediate use of any commercial turf or fertilizer which is registered for sale in Nebraska.

30.05 MATERIALS (GENERAL INFORMATION) (Continued)

F. TOPSOIL

Shall be fertile, friable, natural loam, dark in color (often black), free of subsoil, clay lumps, brush, weeds, roots, stumps, stones larger than 1-1/2" in any dimensions, debris and other extraneous or toxic matter and harmful to plant growth. Topsoil shall be obtained from local sources and exhibit an acidity range (pH) of 6.0 to 8.5. Identify location of source.

G. COMPOST

Shall be humus-like material made from the decomposition of organic materials which may have included leaves, branches, yard prunings and grass clippings such as LINGRO compost. The compost materials shall be decomposed to form a highly stabilized product and screened with 1/2 inc or less screen opening. The compost shall be free of all inorganic debris. LINGRO compost is available from the City of Lincoln's Solid Waste Operation - contact Gene Hanlon (402) 441-7043. Ratio of topsoil to compost should be a minimum of 2 to 1.

H. MULCH

Mulching shall be applied in such a manner as to remain in place. Mulch alternatives shall include the following:

1. Hydro-mulch: If hydro-mulch is used, it shall be evenly applied to all seeded areas at the minimum rate of two thousand (2,000) pounds per acre with a three percent (3%) tackifier and shall be applied immediately after seed application.
2. Peat moss: If peat moss is used, it shall be evenly applied to all seeded areas at the minimum rate of one (1) cubic yard per one thousand (1,000) square feet. The peat moss will be pulverized, will not be less than sixty percent (60%) decomposed organic matter by weight, and will have a pH from four (4) to six (6).
3. Prairie Hay: If hay shall be used, it shall be applied evenly over the seeded surface at the minimum rate of two (2) tons per acre.
4. Wheat Straw: If wheat straw shall be used, it shall be applied at the rate of three (3) tons per acre.
5. All materials used as mulch will be free from all noxious weed, seed-bearing stalks, or roots and shall be inspected and approved the City Engineer, Landscape Architect or Representative.

An alternative may be approved by the City Engineer, Landscape Architect or Representative. Hay shall be obtained from local source.

I. WATER

1. Water shall be potable.
2. The Contractor shall provide water, equipment, methods of transportation, water tanker, hoses, sprinklers, and labor necessary for the application of water.

30.06 GENERAL CONSTRUCTION METHOD

- A.** Examine finish surfaces, grades, topsoil quality and depth. Do not start seeding, sodding or plugging work until satisfactory conditions are corrected.
- B. Under Ground Facilities.** **Contractor will be responsible for having all underground utilities properly located prior to digging/planting. Any utility relocates that are necessary will also be the responsibility of the contractor including any costs associated with them and not the City of Lincoln.** Planting sites less than five (5) feet from lateral underground utility lines (i.e. electric, gas, water, etc.) shall require contacting the City Arborist for street trees or City Landscape Architect or Engineer for park trees so that alternate planting location(s) can be marked.
- C. PREPARATION OF SOIL**
 - 1. Apply Roundup or approved equal non-selective post-emergent herbicide to all areas to be seeded, sodded or plugged prior to preparation. Apply per manufacturer's instructions.
 - 2. Existing weed stubble and small weeds shall be cut and partially incorporated into the soil during seed bed preparation work. All other vegetation that will interfere with the seeding or sodding operations shall be removed by the Contractor. Extreme care shall be exercised to avoid injury to trees and shrubs.
 - 3. Limit preparation to areas which will be immediately seeded, sodded or plugged. The areas shall be prepared not more than three days prior to the installation of materials. Loosen topsoil of areas to a minimum depth of 2 inches. Remove stones over 1 inch in any dimension and sticks, roots, rubbish and extraneous matter.
 - 4. The seed bed shall be prepared not more than three (3) days prior to the installation of seed, plugs, or sod by loosening the soil to a depth of not less than 2 inches nor more than 4 inches by discing, harrowing or tilling. Surface crusting caused by water during the interim must be loosened prior to the seeding operation. all soil erosion shall be filled prior to the seeding or plugging operation.
 - 5. Top soil shall be of a quality to support the growth of grass. The area shall be in a smooth even condition, free of all debris, roots and stones larger than 1 inch in their largest dimension. All lumps of soil shall be pulverized, raked out or removed.
 - 6. Grade lawn areas to a smooth, free draining and even surface with a loose, moderately coarse texture. Roll and rake, remove ridges, and fill depressions as required to drain. Surface crusting caused by water during the interim between preparation and seeding, sodding or plugging must be loosened prior to installation.
 - 7. The seed bed adjacent to curbs, walks or other paved areas shall be finished to a grade of ½" below the paved surface in the case of seeding or plugging and ¾ inch below for sodding.
 - 8. Restore prepared areas to specified condition if eroded, settled, or otherwise disturbed after fine grading and prior to seeding, sodding or plugging.

D. FERTILIZING

The fertilizer shall be applied with approved mechanical spreaders or with an approved hydraulic seeder at the rates specified in these provisions and shall cover the entire area uniformly. Any fertilizer blending shall be approved by the Engineer.

On the basis of the guaranteed analysis, the Engineer shall specify the mixing proportions (if necessary) and application rate necessary to provide the correct (N-P-K) nutrients in conformance with the plans or Special Provisions.

Fertilizers containing quick release sources of nitrogen can be used in the spring and fall when temperatures are not to exceed 80 degrees F. Caution must be taken in application to insure that the rate does not exceed one pound of nitrogen (N) per 1,000 square feet. Quick release fertilizers must be applied to dry foliage only to prevent phytotoxicity. The fertilizer source exhibiting the lowest salt index should be chosen to further prevent phytotoxicity.

Starter type fertilizer shall be incorporated into the soil prior to plugging, seeding or sodding. Maintenance fertilizer shall be applied after laying the sod. The application rates for fertilizer shall conform to Section 30.05.

E. SITE CLEAN-UP

Any remaining peat, soil, sand, rock or similar material which has been brought onto the site by work operations or otherwise, will be removed, and all other remaining debris will be disposed of. All ground area disturbed as a result of the sodding operations will be renovated to its original condition or to the required new condition.

F. BASIS OF PAYMENT

1. GENERAL

The Contractor shall seed, sod, or plug all areas disturbed by construction operations. Limits of the sodding, plugging or seeding areas to be used in determining payment quantities are indicated which lie outside those limits shall be sodded, plugged or seeded at the Contractor's expense. No separate measurement or payment shall be made for soil preparation. This work shall be considered seeding, sodding, or plugging for which direct payment is made.

2. SODDING

Sodding completed in conformance with the plans and Specifications and accepted at the contract unit price bid per square foot for SODDING. Such payment shall be full compensation for all labor, equipment, tools, materials, incidentals necessary to complete the work.

3. PLUGGING

Plugging completed in conformance with the plans and Specifications and acceptable to the Engineers shall be measured and paid for at the contract unit price bid per square foot for PLUGGING. Such payment shall be full compensation for all labor, equipment, tools, materials, fertilize, water establishment period and incidentals necessary to complete the work.

F. BASIS OF PAYMENT (Continued)

4. SEEDING

Seeding of the various types called for on the plans, completed in conformance with the plans and Specifications and acceptable to the Engineer, Landscape Architect or City's Representative shall be measured to the nearest 0.1 or the nearest square foot and paid for at the contract unit price bid per acre or per square foot for SEEDING, TYPE _____. Such payment shall be full compensation for all labor, equipment, tools, materials, fertilizer, water establishment period and incidentals necessary to complete the work.

30.07 COVER CROP

A covercrop may serve as an alternative to providing soil cover when seeding, sodding or plugging is not an alternative. The purpose of selection a cover crop is to prevent soil erosion by wind and water. Cover crops may be used in situations in the following situations:

- A. The window for seeding, sodding or plugging has passed.
- B. If a quick cover is necessary to prevent erosion prior to the completion of the project.
- C. To be planted in conjunction with seed or plugs to provide quicker immediate coverage until the desired specified material is established.

The following cover crops may also be used as mixes requiring adjustments made to the seeding rates.

1. EARLY SEASON (SPRING COVER CROP)

A spring cover crop is planted in early spring to provide soil cover during the spring. Alternatives include:

<u>Type of Seed</u>	<u>Application Rate Lb/acre</u>
Annual Rye	20 - 25
Winter Rye	20 - 25
Fescue	15
Alfalfa (Ranger or Vernal)	18

Seeding Period: March 1 to May 20
General Application: 1 to 1.5 bu/acre

Spring cover crops can be established by aerial seeding in the spring, as well as by drilling or broadcasting seed.

2. MID-SEASON (LATE SUMMER/FALL COVER CROP)

A mid-season cover crop is planted in late spring or early summer to provide soil cover during the late summer and fall. Alternatives include:

<u>Type of Seed</u>	<u>Application Rate Lb/acre</u>
Annual Rye	20 - 25
Fescue	15
Alfalfa (Ranger or Vernal)	18
Seeding Period:	May 21 - July 20
General Application:	1 to 1.5 bu/acre

Mid-Season cover crops can be established by aerial seeding in the late spring to summer, as well as by drilling or broadcasting seed.

30.07 COVER CROP (Continued)

3. LATE SEASON (WINTER COVER CROP)

A winter cover crop is planted in late summer or fall to provide soil cover during the winter. Plants selected need to possess enough cold tolerance to survive hard winters. Alternatives include:

<u>Type of Seed</u>	<u>Application Rate Lb/acre</u>
Winter Rye	20 - 25
Fescue	15
Alfalfa (Ranger or Vernal)	18
Seeding Period:	August 1 - September 30
General Application:	1 to 1.5 bu/acre

NOTE: After August 31, Hairy Vetch may be used at the rate of 25 pounds per acre.

Winter cover crops can be established by aerial seeding in the late summer or fall, as well as by drilling or broadcasting seed.

30.08 SEEDING

The seeding operation shall be restricted to the periods listed under the seeding mixtures (31.05) unless otherwise authorized by the City's Engineer, Landscape Architect or Representative. No work shall be accomplished when the ground is frozen, or otherwise untillable.

Appropriate mechanical spreaders approved the City's Engineer, Landscape Architect or Representative. Hydraulic seeding equipment also may be used when approved by the City's Engineer, Landscape Architect or Representative. All equipment used for the seeding operation shall be as per the manufacturer's recommendations.

A. GENERAL

The Contractor will provide all labor, equipment and materials necessary to furnish and install seed as required by the accepted plans and these STANDARDS AND SPECIFICATIONS.

B. TOPSOIL

Topsoil preparation will be as described in this Section, Topsoil Preparation, of these STANDARDS AND SPECIFICATIONS.

C. BOOSTER FERTILIZER

All fertilizer requirements will meet the requirements of this Section, Topsoil Preparation, of these STANDARDS AND SPECIFICATIONS. A booster fertilizer with the chemical analysis of Nitrogen-18, Phosphorous-46, Potash-0, with four percent (4%) iron and eight percent (8%) sulfur will be applied on the prepared soil at the rate of five (5) pounds per one thousand (1,000) square feet immediately prior to seeding.

D. SEED

Seed will be furnished in sealed, unopened, standard containers and labeled in accordance with the USDA Rules and Regulations and the Federal Seed Act. Seed will be fresh, clean, pure live seed equal in quality to the standards for "Certified Seed". The City at the Contractor's expense may require tests of seed verification.

30.08 SEEDING (Continued)

E. MULCHING

Mulching shall be applied loose enough to allow sunlight to penetrate and air to circulate slowly, but thick enough to partially shade the ground, reduce water evaporation and reduce wind and water erosion. Mulching also shall be applied in such a manner as to remain in place (Refer to Section 30.05 G).

F. SEEDING METHOD

1. Fescue/Bluegrass Seeding

- A. Whenever possible, the seed will be applied using a Brillion seeder or equal equipment to drill the seed into a properly prepared seedbed. The seeder will be equipped with a satisfactory feeding mechanism, an agitator, double disc furrow openers, depth bands and packer wheels. Seed will be sown to a depth of one-quarter inch (1/4") into a properly prepared seedbed. Seed drilling will be done in 2 separate applications crossing the area at right angles to one another to guarantee proper coverage. On sloping land, the final seeding operation will follow the general contour. All seeded areas will be top-dressed with either hydro-mulch or peat moss after the seeding is completed.
- B. In areas where the drill method of seeding cannot be used, a broadcast method may be substituted. If the broadcast method is used, the seeding rate must be doubled, and the area must be dragged after seeding followed by a suitable top dressing.
- C. Immediately following the completion of the seeding operation, the entire area shall be compacted with an approved roller.

2. HYDRAULIC SEEDING

- A. Hydraulic seeding shall be the process by which, initially grass seed is combined with a water solution and applied to a prepared seed bed by means of a hydraulic sprayer. The material shall be a natural or cooked cellulose fiber processed from whole wood chips which will disperse readily in water, mulch, non-toxic dye and other approved additives are combined with a water solution and applied in the same manner. The mulch fibers will physically form a strong moisture-holding mat to assist in soil erosion control, while providing percolation properties and favorable micro climate conditions.
- B. Hydraulic seeding equipment shall include a pump, rated and operated at 100 gallons per minute (375 L/min) and at 100 psi (690 kPa) pressure, unless otherwise directed by the Engineer, Landscape Architect or City's Representative. The equipment shall have a suitable pressure gauge, and a nozzle adapted to the type of work. Storage tanks shall have a means of estimating the volume used or remaining in the tank. When using hydraulic seeding, the seed bed preparation, fertilize, and watering instructions shall be in accordance with the requirements of this chapter as stated for "Seeding".

All equipment and materials shall be approved by the Engineer, Landscape Architect or City's Representative prior to the seeding operation.

30.08 SEEDING (Continued)

3. NATIVE SEEDING

- A. Whenever possible, the seed will be applied using a drill-type seeder. Seed will be sown to a depth of one-half inch (½") into a properly prepared seedbed. On sloping land, the seed shall be applied following the general contour. All seeded areas will be top dressed with either hydro-mulch, peat moss, or straw after the seeding is completed.
- B. In areas where the drill method of seeding cannot be used, a broadcast method may be substituted. When using the broadcast method, the seeding rate must be doubled, and the area must be scarified and dragged after seeding, followed by a suitable top dressing.

G. ADDITIONAL FERTILIZING

At the time of the first mowing, the Contractor will apply a commercial fertilizer with the chemical analysis of Nitrogen-20, Phosphorous-10, Potash-5, plus two percent (2%) iron at the rate of five (5) pounds per one thousand (1,000) square feet. Care should be taken to prevent burning. Any areas disturbed or damaged by the Contractor during fertilizing operations will be repaired in accordance with these STANDARDS AND SPECIFICATIONS at the Contractor's expense.

H. WATERING

The Contractor will be responsible for watering the seeded area(s) a minimum of two (2) times per day (mid-morning and late afternoon) and for keeping the areas moist until the lawn is established. The Contractor will be responsible for water usage until such time as the project is accepted by the City Council.

I. INSPECTIONS

Inspections shall be completed in accordance with this Section, Inspections, of these STANDARDS AND SPECIFICATIONS. The Contractor must notify the City for inspections of seed certification and germination.

J. GERMINATION INSPECTIONS

When germination is complete and plants are visible, the Contractor will notify the City and request a germination inspection for approval in order to begin the guarantee period. Any areas deemed by the City to be thin, weak or dead will be replaced at this time. All washouts will be reseeded immediately after the germination inspection. No partial acceptance will be made. The Contractor shall be responsible for the growth of the seeded area. Any portion of the seeded area that is not in good growing condition at the end of thirty (30) days shall be re-seeded as specified for "Seeding" above.

30.09 SODDING

Sod shall not be placed on frozen ground or during drought periods. The sod shall be moist when it is placed. Dry and/or frozen sod will not be accepted. Transverse joints between sod strips shall be staggered. The sod shall be placed carefully to produce tight joints. The sod shall be watered immediately after it is placed. Firming shall be accomplished by rolling the newly placed sod with an approved sod roller within seven (7) days after it is replaced.

30.09 SODDING (Continued)

A. GENERAL

The Contractor will provide all labor, equipment and materials necessary to furnish and The Contractor will provide all labor, equipment and materials necessary to furnish and install all sod as required by the accepted plans and these STANDARDS AND SPECIFICATIONS.

B. TOPSOIL

Topsoil preparation will be as described in this Section, Topsoil Preparation, of these STANDARDS AND SPECIFICATIONS.

C. BOOSTER FERTILIZER

All fertilizer will meet the requirements of Section 820.00, Topsoil Preparation, of these STANDARDS AND SPECIFICATIONS. A booster fertilizer with a chemical analysis of Nitrogen-12, Phosphorous-12, Potash-4, with four percent (4%) iron and eight percent (8%) sulfur will be applied at a rate of five (5) pounds per one thousand (1,000) square feet immediately prior to sodding.

D. CARE AND HANDLING

Care will be exercised at all times to retain the native soil on the sod roots during transportation, handling and planting. Dumping sod from vehicles will not be permitted. The sod will be transported to the site within twenty-four (24) hours from the time it is cut, unless it can be stored to the satisfaction of the City. During delivery and while in stacks, all sod will be kept moist and protected from exposure to the wind, sun and freezing. All damaged or dry sod will be rejected.

E. TRANSPORTING SOD ON SITE

Sod can be transported on or across the site on pallets by forklift. Damage to the sod bed by the vehicles will be kept to a minimum and will be regraded before sodding of the area. Damage caused to paving, curbs, fence, plants or other objects during sodding, will be repaired or replaced by the Contractor at his expense as directed by the City.

F. INSTALLATION

The sod bed will be lightly sprinkled just prior to laying the sod. All sod strips will be placed tightly against each other so no open joints are apparent. Joints between ends of strips will be staggered at least one foot (1') between adjacent rows. At the end of walks and drives, the sod will have the same finish grade as the abutting surfaces. At curbs the sod will have the same finish grade as the top of the curb. Sod placed on slopes equal to four horizontal to one vertical (4:1) will be staked with wood or wire pins not less than six inches (6") long and spaced not more than thirty inches (30") apart. The pins shall be driven into the ground at an angle against the flow of the water until the top of the stake is three inches (3") above the sod. Sod laying will begin at the bottom of the slope and progress upward with strips laid transverse to the slopes. Immediately after the sod has been laid, it should be tamped or rolled with approved equipment to eliminate all air pockets and to provide a smooth, even surface. Immediately after rolling or tamping the sod, sufficient water will be applied to completely saturate the sod. The sod will be watered as often as required to prevent it from drying out. Settled sod areas will be pulled up, regraded, relayed, and retamped.

30.09 SODDING (Continued)

G. MAINTENANCE

The proper care and maintenance of the sodded areas will be the responsibility of the Contractor until the work has been completed and accepted by City Council. The maintenance operations will begin as soon as each portion of the area is sodded. Maintenance will consist of repair and replacement of eroded areas, watering, mowing (when the sod is established), weeding, fertilizing, and resodding as necessary to provide an even, consistent stand of grass. All replacement sodding deemed necessary by the City will be done by the Contractor at his own expense.

H. MOWING

During the maintenance period, after the sod is established, the Contractor will begin mowing all lawn areas on a routine basis using a mowing height of three inches (3"). Frequency of mowing will be determined by the growth rate of the grass but at no time should the clippings exceed two inches (2") in length. Only turf-type mowers will be used for this operation.

I. ADDITIONAL FERTILIZING

Thirty (30) days after sod is laid, an application of fertilizer with the chemical analysis of Nitrogen-12, Phosphorous-12, Potash-4, with four percent (4%) iron and eight percent (8%) sulfur will be applied at the rate of six (6) pounds per one thousand (1,000) square feet. When applied, the fertilizer must be dry and free flowing. All damage caused to the sod during fertilizer application will be repaired by the Contractor at his expense.

J. WATERING

The Contractor will be responsible for watering the sodded area(s) a minimum of two (2) times per day (mid-morning and late afternoon) and for keeping the areas moist for a period of fourteen (14) days following the initial sodding operation and until the sod is established.

K. INSPECTIONS

Inspections shall be completed in accordance with this Section, Inspections, of these STANDARDS AND SPECIFICATIONS. The Contractor must notify the City for inspection of sodding. When sodding operations are complete, the Contractor will notify the City and request a sodding inspection for approval in order to begin the guarantee period. Any areas deemed by the City to be thin, weak or dead will be replaced at this time. No partial acceptance will be made. Any portion of the sodded area that is not in good growing condition will be moved and replaced with fresh live sod. If the sod has been replaced the water period will begin again for fourteen (14) days following the replacement.

30.10 PLUGGING

A. GENERAL

The Contractor will provide all labor, equipment and materials necessary to furnish and install all sod plugs as required by the accepted plans and these STANDARDS AND SPECIFICATIONS.

B. TOPSOIL

Topsoil preparation will be as described in this Section, Topsoil Preparation, of these STANDARDS AND SPECIFICATIONS.

30.10 PLUGGING (Continued)

C. SOD PLUGS

The Contractor shall obtain from strongly rooted nursery grown sod composed of the following grass species (Refer to Section 30.06) Provide healthy living stems with attached roots. Provide 1" x 1" plugs. Plugs shall be uniform in color and quality and shall be free of weeds, disease or visible imperfections at the time of acceptance.

D. OVERSEEDING WITH COVER CROP (Alternative)

To expedite coverage of an area, annual rye may be used as a cover crop in conjunction with the sod plugs. The overseeding of annual rye shall be between 1 and 2 pounds per 1000 sq. ft. This will provide quick coverage and still allow for the establishment of the plugs. Overseeding may result in clean-up of spent crop by mowing.

E. BOOSTER FERTILIZER

1. Fertilizer shall be a commercial turf product containing nitrogen, available phosphoric acid (P205) and soluble potash (K20) as required, in recognized plant food form. All fertilizers shall comply with the provisions of the State of Nebraska Fertilizer Act of 1955, with subsequent revisions.
2. Granular, non-burning product of neutral character composed of not less than 50% organic slow acting, guaranteed analysis professional fertilizer. Starter fertilizer containing 10% nitrogen, 20% phosphoric acid, and 10% potash by weight, or similar approved composition. Fertilizer shall not contain any herbicide or weed killers.

F. PRE-EMERGENT CONTROL

Plateau Herbicide manufactured by American Cyanamid Company, or approved equal.

G. POST-EMERGENT CONTROL

Round-up Herbicide, manufactured by Monsanto, or approved equal. Do not apply product containing 2, 4-D if temperatures are expected to exceed 80 degrees F on the day of application.

Dormant buffalograss can be sprayed with Roundup or equivalent to control winter weeds. Fall applications can be applied after the first frost or when the buffalograss turns straw-brown.

Spring Application of Roundup or equivalent can be done in early April. A period of two weeks should be allowed for the herbicide to work. Roundup or equivalent should not be applied to buffalo grass if the dormant turf is showing any green color. Roundup or equivalent applied to semi-dormant buffalograss will significantly delay green up and could severely damage the grass.

H. CARE AND HANDLING

1. Care will be exercised at all times to retain the native soil on the sod roots during transportation, handling and planting. Dumping sod plugs from vehicles will not be permitted. The sod plugs will be transported to the site within twenty-four (24) hours from the time harvested, unless it can be stored to the satisfaction of the City. All sod plugs will be kept moist and protected from the exposure to the wind, sun and freezing. All damaged or dry sod plugs will be rejected.
2. Do not harvest or transport sod plugs when moisture contact may adversely affect sod survival.
3. Protect sod plugs from sun, wind, and dehydration prior to installation.

30.10 PLUGGING (Continued)

I. INSTALLATION

1. Plugs shall not be placed during periods of drought.
2. Plant individual plugs with root cluster and portions of stem buried in soil. Firm soil around plugs after planting. DO no cover tips.
3. Space plugs 12 inches on center each direction or as otherwise specified by the City Engineer, Landscape Architect or Representative.
4. Drill a hole 1 1/4" diameter and 1 1/4" deep. Place the plug into the hole, being sure the plug is to the bottom of the hole. Failure to place plug firmly to the bottom of hole will create an air pocket under the plug, reducing the change for survival. Measure for the next plug, using the specified spacing. Repeat installation procedure. Continue in a straight line to the end of the planting area. Move the specified spacing for the second row and continue planting. Stagger plugs as in figure 1.

```
  X   X   X   X   X   X   X   X   X
    X  X  X  X  X  X  X  X  X  X
  X   X   X   X   X   X   X   X   X
```

Figure 1.

5. Plant plugs and lightly roll with lawn roller
6. Water plugs with a fine spray immediately after planting.
7. If plugs are installed in an area with a 4:1 slope or greater, an erosion control blanket shall be laid over the entire plugged area. Secure erosion control blanket to ground with 6" wire staples, 6" wood or 6" plastic pins.
8. Plugged areas shall be watered twice daily for 10 minutes per setting during the first fourteen (14) days after planting. After fourteen (14) days, the plugged areas shall be watered once per day for fifteen (15) minutes per setting. After the fourth week, soak the area once or twice per week until plugs have covered the area. These guidelines are subject to variance with the City Engineer, Landscape Architect or Representative.
9. Apply Plateau herbicide, or approved equal pre-emergent control within 5 days after initial watering at a rate of 1 ounce per acre.
10. Apply starter fertilizer to sodded areas at a rate equal of 1.0 pound of actual nitrogen per 1,000 square foot. Apply first application of fertilizer three (3) weeks after initial sodding. Apply fertilizer by mechanical rotary or dry type distributor, thoroughly and evenly incorporated across the sodded areas. Apply second application of fertilizer eight (8) weeks after initial sodding.
11. A lightweight, biodegradable, erosion control blanket such as XCEL SR Straw blanket, XCEL S-2 Superior excelsior blanket, North American Green DS150 or equivalent may be used over the top of the plugs to preserve moisture or control erosion at the discretion of the City Engineer, Landscape Architect or Representative.

30.10 PLUGGING (Continued)

J. MAINTENANCE

1. Maintain plugged areas until completion and acceptance of the entire project. Maintain plugged areas including watering, weed control, mowing, application of herbicides, fungicides, insecticides, resodding until an established planting is achieved and accepted by the City Engineer, Landscape Architect or Representative.
2. A nitrogen fertilizer should be used every thirty (30) days until fully established.
3. Keep all plugged areas thoroughly watered for sixty (60) days after final acceptance of the entire project per the Specifications. Any portion of the plugged area that is not in good growing condition at the end of the sixty (60) days shall be re-plugged as specified above.
4. Begin mowing the plugged area as soon as the plugs attain a height of 3 inches and cannot be easily pulled out of the soil. Maintain all plugged areas at a height of 3 inches for sixty (60) days after the final acceptance.
5. Repair, rework and replug all areas that have been washed out, eroded, or do not catch at the end of the sixty (60) days.
6. The proper care and maintenance of the plugged areas will be the responsibility of the Contractor until the work has been completed and accepted by the City.

K. INSPECTIONS

Inspections shall be completed in accordance to these STANDARDS AND SPECIFICATIONS. The Contractor must notify the City for inspection of plugged areas. When operations are completed, the Contractor will notify the City Engineer, Landscape Architect or Representative and request an inspection for approval in order to begin the guarantee period. Any areas deemed by the City to be thin, weak or dead will be replaced at this time.

30.11 ACCEPTANCE AND ESTABLISHMENT PERIOD

- A. Upon completion of planting the City Engineer, Landscape Architect or Representative will inspect the seeded/sodded/plugged area(s) for acceptability. The Contractor will be notified of the dates of this inspection. All items of work as required in the Specifications, the Special Provisions, and the plans shall have been performed prior to this inspection. Any item not been completed may make a plant unacceptable. Unacceptable materials may be allowed to remain in place without payment. A subsequent inspection may be made subsequent to the initial inspection to determine the acceptability of material and therefore, allowing payment for such materials.
- B. During the establishment period, the Contractor shall properly maintain all materials planted under the contract. The establishments procedures shall include, protective measures against pests and diseases, watering as often as required by necessity, seeding with a pre-emergent weed control or other approved means, and other establishment procedures as deemed necessary by the City Engineer, Landscape Architect or Representative, including the removal of any dead plant material for the project. **Note: the Contractor is responsible for watering all plant material as necessary during the establishment period.**

30.11 ACCEPTANCE AND ESTABLISHMENT PERIOD (Continued)

- C. The establishment period will follow the completion of all planting and shall extend for a period of:

SEED	Thirty (30) days
SOD	Fourteen (14) days
PLUGS	Sixty (60) days

The establishment period will not begin until all of the following items of work as required in the Specifications, the Special Provisions, and the plans have been performed including proper installation of material, watering, fertilizing and mulching. All plant material shall be in viable growing condition when the project enters the establishment period.

- D. Upon completion of the establishment period, the City Engineer, Landscape Architect or Representative will make an inspection of the seeded/sodded/plugged material to identify any material to be replaced under warranty. The inspection will normally be made during the month that the establishment period terminates. The Contractor will be notified of the dates of this inspection. A list of quantities and locations will be provided to the contractor for replacement. Replacement of materials shall occur within receipt of this list. Plant replacement shall be at the Contractor's expense. Establishment procedures that have not been performed shall be brought to the Contractor's attention and may cause the establishment period to be extended. **All replacement plant material shall receive the establishment procedures referred to in this Section.** The Contractor will be notified in writing when his/her establishment responsibilities on the acceptable material have been terminated.

30.12 REPLACEMENT OF MATERIAL AND GUARANTEE PERIOD

The guarantee period for seeded/sodded/plugged areas shall begin at the date of acceptance.

The Contractor shall guarantee all material to be in healthy and flourishing condition for a period of:

SEED	Sixty (60) days
SOD	Thirty (30) days
PLUGS	Ninety (90) days

from date of acceptance.

The Contractor shall replace, without cost, and as soon as weather conditions permit and within a specific planting period, all materials determined by the City Engineer, Landscape Architect, or Representative to be dead during or at the end of the guarantee period.

Replacement material shall closely match adjacent specimens of the same species that have been planted. Replacements shall be subject to all requirements, standards, special provisions and specifications stated herein.

The guarantee of all **replacement** plants shall extend for an additional period of:

SEED	Sixty (60) days
SOD	Thirty (30) days
PLUGS	Ninety (90) days

30.12 REPLACEMENT OF MATERIAL AND GUARANTEE PERIOD (Continued)

from date of their acceptance and installation. In the event that replacement materials are not acceptable during or at the end of the said extended guarantee period, the City Engineer, Landscape Architect or Representative may elect subsequent replacement or credit (refund) for them.

30.13 VANDALISM

Seeded/Sodded/Plugged areas damaged as a result of vandalism are not required to be replaced as apart of this contract.

30.14 QUALIFICATIONS FOR SUBMITTING BIDS

- A. Contractor must be able to demonstrate a minium work experience record.
- B. Contractor must be able to demonstrate successfully completed projects similar to scope and scale.

30.15 REQUIREMENTS FOR SUBMITTING BIDS

All bids submitted must include the following information on the **BID PROPOSAL**:

- A. The unit price for each type of seed mix/sod or plug variety listed on bid PROPOSAL is to include furnishing, delivery and installation at various locations throughout the City of Lincoln.
- B. The quantity of seed/sod/plugs which can be furnished is to be entered on the bid form. Total price is the unit price multiplied by the quantity that bidder can provide in relation to the quantity needed per project completion.
- C. All bid prices shall be firm and shall include all necessary labor, materials and equipment required as specified within these specifications.
- D. Bids submitted shall conform to the contract forms and the specific requirements of these specifications.
- E. Specified seed/sod/plug materials shall conform to the measurements specified on the bid PROPOSAL list.